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ABSTRACT

This paper describes Clear View Elementary School's (California) successful experience with integrating technology into the curriculum. Since its inception seven years ago, the school has acquired 250 computers, networked them all on two central file servers, and computerized the library and trained all staff members to be proficient facilitators working with students as they investigate library resources and generate multimedia projects. Ten full days for two years were focused on technology teacher training with two-thirds of the staff development dollars directed to this effort. Since 1993, all students use computers and the upper grade students use the fiber optic connection as part of their daily electronic routine of learning reading, writing, science, and math. The scene in Clear View classrooms is engaging as teachers use the teaching learning centers model: 10 children engaged in lessons using the computers, another 10 receiving small-group instruction from the teacher, and the remaining students working at their desks using hands-on practice lessons. Student projects, elementary-university partnership in professional development activities, and four years of research and development are discussed. (AEF)

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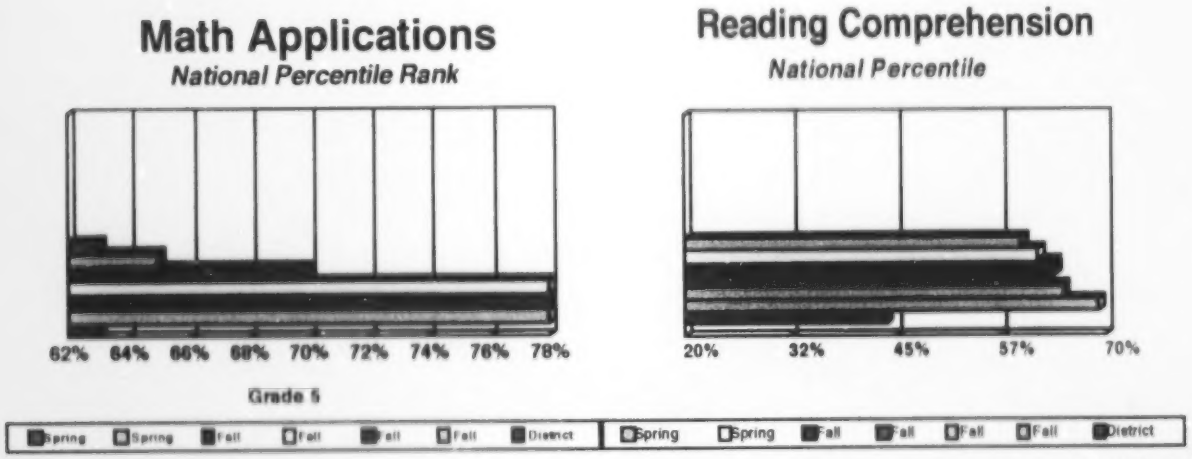
ED 419 518

Log On to the Future: One School's Success Story

by Ginger Hovenic EdD
Founder of Clear View School and Executive Director of the Classroom of the Future Foundation

"My daughter doesn't want to miss a day because school is so exciting. There is so much to learn in a meaningful way. She is definitely motivated!" exclaims her parent.

Clear View Elementary School, located five miles from the Mexican Border, opened seven years ago, with only a few teachers who knew how to turn on a computer. Since that time Clear View has acquired 250 computers, networked them all on two central file servers, computerized the library and trained all staff members to be proficient facilitators working with students as they investigate library resources and generate multimedia projects expressing their learning. The population was diverse with 20% Asian, 53% Hispanic, 3% African American and 24% Caucasian. 28% of the families in this area was living below the poverty level and the school had a 21% transiency rate. Twenty-three different languages were spoken and 70% of the population were new English learners. The staff was very diverse with 80% over forty-five years of age and 80% having taught over 20 years. Parent volunteer involvement increased by 314% in the past three years with over 16,000 volunteer hours logged during the '95-'96 school year and PTA events were standing room only. The school had also seen a dramatic shift in academic achievement as the students' performance rate jumped dramatically on the Stanford Achievement Test, a national standardized test.


Math Applications
National Percentile Rank
62% 64% 66% 68% 70% 72% 74% 76% 78%
Reading Comprehension
National Percentile
20% 32% 45% 57% 70%
Grade 5
Spring Spring Fall Fall Fall Fall District
Spring Spring Fall Fall Fall Fall District

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Ginger Hovenic

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Clear View's vision is based on preparing children to function effectively in a world of new ideas; to think independently, critically and creatively; to become collaborating members of a democratic and multicultural society; and to become lifelong learners. The school is dedicated to recognizing the unique value of each person; providing active leaning in a safe, supportive environment; developing an understanding of contemporary issues and technology; and promoting a partnership between home, school and community.

Technology Making A Difference

Ten full days for two years were focused on technology teacher training with two-thirds of the staff development dollars directed to this effort. Teachers worked together to share information and projects as individual teacher skills grew. The teachers expressed they began to recognize technology as the spark to incredible interactive class discussions or taking a group of students on an electronic field trip providing an exciting opportunity for learning without ever leaving the classroom.

Since 1993, all students use computers and the upper graders use the fiber optic connection as part of their daily electronic routine of learning reading, writing, science and math. The scene in Clear View classrooms is engaging as teachers use the teaching learning centers model: 10 children engaged in lessons using the computers, another 10 receiving small-group instruction from the teacher, and the remaining students working at their desks using hands on practice lessons—remember this in a school where 70% of the 580-member student body were new English learners.

Here's what the Clear View kids are doing that brings such excitement. Using the theme of US History and Ancient Civilizations, 10 and 11 year-old student camera crews, set directors, costume designers, and script writers in Mrs. LeCompte's class created a explosive court scene to ask questions and examine issues of slavery against the law of Hammurabi and the law of human decency. They assembled a courtroom set and videoed students portraying characters representing a time spectrum including Joseph in the Old Testament; Moses; Spartacus, King of Babylonia; Nate Turner; Frederick Douglass; and Harriett Tubbman. In preparation, they connected to the *Information Superhighway* to speak with Dr. Frank Stites, a professor at San Diego State University, and five history students who served as consultants as students wrote their scripts. John Spillane, a professor at the University of Maryland, also taught them how lighting, sound and camera angles impact viewer reaction. During the premiere performance shown to parents and the community, students examined their work and explained that although this may look like a simple process that passed by in a few minutes many dimensions of complexity in research, writing and oral presentation stand behind their product. They explained the expression of the right word and the right balance of words were critical as they demonstrated their learning of history.

Business Sharing In The Process

The *Information Superhighway* was installed in November of 1992 and is actually a fiber optic connection between Clear View and Cox Communications' head end. This connection enables voice and video two-way transmission to San Diego State University's campus, UCSD Medical Center, and other locations related to student projects. This began in 1991 as part of sharing information with a business advisory consortium called Educational Innovations In Teaching and Technology (EDITT). This group was formed by Clear View to promote the exchange of ideas and information and to facilitate improvements in the preparation of teachers for students of the New World. They said "When I see the kids at Clear View working together, learning together and traveling in uncharted territories, I gain a renewed sense of hope in our educational system." Clear View has also formed business and parent partnerships which allow such innovative programs as parenting skills workshops and voice mail for each teacher which provides a 24-hour communication link between teacher, parent and student for homework assignments, school events and other news. Partners such as Cox Communications, IBM, Lego-Dacta, Otay Water District, Wells Fargo, San Diego County Teacher's Credit Union, and the U.S. Navy Helicopter Squadron 41 had become an integral part of the learning environment at Clear View.

Clear View students communicated and shared weather data with other students around the nation via computer modem; wrote and published an historical book about Justice John Marshall with the collaboration of a history professor at San Diego State University; accessed a laser disc 20th Century Video Library , and exchanged thoughts and research with students in Rhode Island, Nebraska and England, about V-E Day and World War II. Internet student and adult projects ventured into an unprecedented explosion of worldwide learning opportunities for students.

Every course of instruction had a technology component; thus, even the youngest kindergarten children used computers to explore writing, math, art and reading. By first grade, Clear View students used computers to activate a Lego town that they build from scratch and shared weather forecasting with students across the country via a racey cable modem @HOME provided by Cox Communications. Second graders studied robotics and programed simple machines to demonstrate mathematical concepts. In third grade, they studied how sound travels through air using fax machines. Fourth through sixth graders experienced spreadsheet applications, multimedia projects, computer art software and global awareness through the Internet and the Cox Communications fiber connection (Information Superhighway).

Electron Microscope

Fourth grade students began studying the scientific process and decided to look at their own hair since it was readily available. Each student sent a hair sample to SDSU on tiny examination posts supplied by Dr. Steve Barlow, Electron Microscope Project Assistant

Director. Then it was time for students to turn on their classroom television and hook up the fiber connection to have a two way conversation with Dr. Steve. Each student gave verbal directions to Dr. Steve, regarding magnification and ways to turn their sample. After half the class had seen their sample and directed Dr. Steve, questions began to emerge such as "I wonder if there is a difference between brown hair and black hair?", "What about straight hair, wavy hair and curly hair?", "Does permed hair look different than moosed hair?", and "Is there a difference between my mother's hair, my brother's hair and my hair?" The students then began to use the scientific process of investigation to look at everyone's hair and to categorize samples. Each student then produced a short research analysis project which resulted in having their science learning displayed around the classroom.

Other projects emerged throughout the year as students investigated the difference between the hair on their teachers head, his arm, his leg and moustache. As their enthusiasm for science investigation continued they began to pick up bugs from the playground. Mounting the specimens and then having Dr. Steve put them under the electron microscope, they soon noticed that the insects had different shaped mouths so they began an investigation to see if there was a relationship between the shape of the insect's mouth and the shape of what the insect's ate.

Actually, working on the electron microscope and fiber connection began when Dr. Steve Barlow, SDSU called Clear View teacher, Jim Dieckmann after reading about Clear View in the university newspaper. They shared ideas about what projects students could investigate having access to the powerful $100,000 microscope located at SDSU, 26 miles from Clear View. They shared their incredible ideas with Cox Communications and a fiber optic connection was established.

UCSD Medical Center Connection

Another project involved students in Mrs. Marion's fifth and sixth grade who were working on wellness issues and communicable diseases. They collected data from the Internet, videos, interactive laser disks, and CD roms to form the basis of their investigation of body systems. They grew bacteria, then began running experiments by coughing in petri dishes and comparing the use of antiseptic soaps vs non- antiseptic soaps. They prepared questions for discussions through the fiber connection with doctors and nurses at University of California, San Diego Medical Center. As they wrote their project summaries they learned that the antiseptic soap prevented most bacteria from growing and if they washed their hands before lunch and several times a day less students got sick.

Clear View's schoolwide exploration of technology has resulted in students who are motivated, attend regularly, participate with enthusiasm, articulate significant higher-order thinking skills, and achieve incredible academic success. Teachers say, "All children have become thinkers and creators. It no longer satisfies them to read a chapter in an outdated

textbook and answer questions. By using technology tools, the children have acquired essential work related skills as well as positive self esteem."

Student "Techies"

Staff at Clear View found that one of the most effective uses of limited resources is the development of student technicians. Teachers identified students for their technical aptitude, enthusiasm about computers, and personal motivation, who then were taught to set up and operate the fiber optic connection and recognize and correct problems. These student support teams then trained new teams in the lower grades, which ensured ongoing support for the coming year. For the student "techies," the training process was much like the learning of a second language or mathematical idea. For the school, it was an important and effective means of maximizing student learning potential.

Professional Development School

Clear View's technological transformation is partly attributable to being originally designed as a Professional Development School as a joint venture with San Diego State University. Each demonstration classroom was equipped with audio and video recording capabilities, as well as observation areas separated by one-way glass to observe classes in session without interruption of instruction.

The Professional Development School concept has been discussed in literature on teacher education reform for the past several years. Although national organizations have called for the establishment of such schools, actual operating examples are rare.

The Chula Vista Elementary School District and the San Diego State University School of Teacher Education worked together to develop a curriculum and staff development focus for this Professional Development School and three specific goals of the program were identified:

1. Provide a comprehensive field-based pre-service teacher preparation program for the fifth year toward a teaching degree.

2. Create a comprehensive program for the continuing development of teaching professionals at the Chula Vista Elementary School District; and

3. Provide a place where educational professionals can come together to study teaching and learning, conduct research, and consider alternative structures and organizations of classrooms in the context of public education.

Pre-service Teacher Preparation Program:

Thirty student teachers met on the Clear View campus every semester for their multiple subject credential block. The program was targeted at observing real classroom situations and giving feedback as the observations took place. Clear View teachers became instructors of mini lessons highlighting classroom management, specific curricular areas and even role models regarding the teaching profession.

Professional Development of Chula Vista District Staff:

The Professional Development School also functioned as a center for continuing staff development and curriculum innovation. SDSU curriculum coordinators scheduled workshops on such subjects as math for practicing district teachers and used the observation classrooms as a way of demonstrating how theory is put into practice using students in a real classroom situation. These instructional approaches, organizational methods and management strategies were demonstrated and implemented for replication at the other thirty-two district school sites.

For the first-year teachers these classrooms provided a rich environment for orientation seminars and specific workshops designed to ensure successful transition of teaching responsibilities.

Research and Inquiry:

The professional development school provided the site where SDSU faculty and CVESD teachers and administrators collaboratively developed new strategies and approaches to optimize conditions for learning. The systematic reflection on practice, organization of classrooms, and conditions of the school as an institution of pedagogy became a critical element to disciplined inquiry and provided the arena for conversation putting theory into practice.

Through the research and inquiry process, Clear View started to look at restructuring by reshaping the governance of the school; diving deep into the scope and sequence of the curriculum and instruction; promoting Spanish primary language instruction; implementing technology as an instructional tool; involving business and community agencies as partners; and engineering infrastructures such as a *Families* (multi-grade school culture experience) and Peace Patrol (conflict resolution) concept, to provide enrichment and maximum opportunities for academic achievement for all students.

Engineering Infrastructures

For as long as students were at Clear View, they were permanently assigned to one of 25 *Families* which were cross-age groups that met for 45 minutes every Thursday morning for special school culture activities. These 25 K-6 groups studied social, environmental and global issues and built skills to facilitate student success in and out of the schoolroom. *Families* were the core concept to promote self esteem, acceptance, conflict resolution (Peace Patrol), global awareness, and helping others. Weekly assemblies also offered opportunities for oral, written, and listening language skills, cultural awareness and recognition of social and academic achievement.

Instructional Methodologies

Cooperative learning, complex instruction, Socratic seminars, large and small group instruction and a variety of traditional and nontraditional teaching methods were seen in

classrooms every day. Learning centers, manipulatives, project-based instruction, integrated and thematic approaches to knowledge acquisition were used to reinforce the spiral of learning in all subject areas.

You might be asking, **"How do you know all this is making a difference?"** We all know, assessment is a vital issue in education today. Schools and institutions are demanding accountability and assessment tools are becoming the instrument to inform the public regarding increased student learning. Educational institutions want to showcase what they value in student work and students themselves are becoming empowered to "show" what they know. The Clear View staff felt traditional forms of assessment were only one part of the story and had become too narrow--too limited--and were unable to assess valued student talents and behaviors. The search continued for more complete assessment and for clear and appropriate achievement targets; therefore, alternative assessment was to become an essential tool for looking at student work in a more holistic way.

Upon investigation of new assessment tools the staff found many states had constructed, or were in the process of constructing a set of Curriculum Standards or Frameworks that defined high quality student work. Tools were being investigated which could measure previously unmeasurable skills and, at the same time, empower students to become responsible learners. Ultimately, the staff believed this would raise the bar for student achievement.

Since that initial investigation, Clear View devoted six years to defining and promoting high level performance, developing activities which engage and demand excellence of the learner, and constructing assessment tools which measured student growth in meaningful ways. The following is a list of alternative assessment used:

- Performance Assessment
- Schoolwide Longitudinal Database
- Student-Led Conferences
- Student Paper Portfolios
- Holistic Writing
- Student-Generated Rubrics
- Protocol/Exhibitions
- Electronic and Video Portfolios

Creating and using alternative assessment directly affected classroom curriculum, management and the learning environment. The goal of this type of assessment was to provide usable information for students, teachers and parents regarding student learning. Assessment authorities such as Grant Wiggins and Richard Stiggins state that, if we wish to have effective schools, we must make sure each teacher is a confident, competent assessor of student achievement. And if we wish to maximize learning, we must make sure students are the most confident, competent assessors of their own achievement that they can be.

Clear View's 1992-97 participation in the Research and Development Project through the California Center for School Restructuring required the staff to focus on powerful learning for all students as well as examining student work through alternative methods of assessment.

Reflection became an important ingredient in the process of evaluation as all members of the learning community learned to reflect on student work; the student, peers, parents and teachers. Reflection not only empowered students to learn from their own work, but it became a focal point for discussion among teachers and with the parent and child. This became a natural component of alternative assessment enabling the learning experience to become more powerful for everyone involved.

Year One

The staff began the process of examining student work by developing Learning Outcomes in five areas: Cognitive Processing, Science/Technology, Physical, Social/Emotional and Communication. These were developed after reflection and discussion on the question: What do we want a Clear view student to look like when he/she is promoted from 6th grade?

Once Learning Outcomes were developed, the staff met in developmental groups: K-2, 3-4 and 5-6 to establish benchmark learnings that would support each Learning Outcome at each developmental level. The idea was to design-down and deliver-up. The benchmarks were designed from the 6th grade to Kindergarten so that curriculum could be delivered up through the grade levels in a well- thought-out continuum of learning to meet the goals. To increase articulation of important learnings and address developmental stages of students, student benchmark learnings reflected the developmental groups: K-2, 3-4 and 5-6. Each flowed from the Learning Outcomes in the five categories, clearly spelling out what these learnings would look like at various developmental stages. This provided the link that helped students, parents and teachers "see" what each learning outcome's activities would look like.

Year Two

During the 1993-94 school year teachers began working with student-generated rubrics in various curricular areas. Student work began to show students were becoming empowered to articulate essential learnings and goals. Discussions in the classroom led to students sharing ideas and assisting one another on projects; checkpoints became important to students as they realized outcomes could be affected by self and peer reflection and evaluation, improving the quality of their work.

Teachers and students began to use The Protocol as a model for formal presentation of important learnings which led to further articulation of learning, including how they prepared the important learnings and how they would use these learnings in different situations or in the future.

Also during this year staff members met in grade level teams to discuss portfolio use. It was decided to concentrate first on the area of Language Arts and to devise a portfolio that contained authentic pieces of student work and assessment that would clearly illustrate the

goals for students in primary and upper grades. Each grade level team developed special portfolio contents aligned with benchmark learnings. Although many teachers were involved in the beginning stages of portfolio collection, some began to include selection and reflection by students to further define the contents and make the process more meaningful.

Some teachers used student led conferences as a means of empowering students to more readily communicate their learnings to parents. Students made parents aware of their strengths and areas targeted for growth as they discussed portfolios. Parents filled out a "Parent Reflection" sheet which communicated to their child what they thought about the findings in the portfolio as well as how they, as parents, might support the child's educational growth.

At the end of the year a staff survey was used to determine where each staff member was on the continuum of portfolio usage. Then the entire staff brought portfolios to a staff portfolio protocol exhibition. Teachers shared items from their portfolios and discussed techniques used to make portfolios a meaningful means of assessment. Sharing enabled all staff to see what each other was doing as well as glean ideas to make portfolios more meaningful for students.

The Educational Summit held in the evenings once a year also provided a great arena to share student achievement with the huge numbers of community members and parents who wanted to know how the school was faring on student achievement. The staff and the school governance team members presented data relating the increase in student achievement and ways parents could assist at home which would usually last about thirty minutes. Then parents would ask questions in a town hall meeting style regarding challenges and celebrations they saw as parents.

Year Three

This year began with adjacent grade level groups (K-1, 1-2 etc.) reviewing the Scope and Sequence for portfolios based on three categories: purpose; content which illustrates listening, speaking, reading and writing; and reflection. Each group included items from the three categories as well as tasks and items built upon each other. Agreement was also reached on materials to pass on in the portfolio at the end of the year to next year's teacher.

Another important step in year three was the decision to construct a database for the entire school population. This utilized not only standard methods of assessment, but included alternative methods that supported outcomes and state frameworks. Calibrating teachers to evaluate assessment pieces became essential so that the scores would be uniform and meaningful. The resulting data could be sorted and would, ultimately, show important longitudinal trends in student learning at various grade levels and in various categories.

Articulating student learning, an outgrowth of all this work, naturally seemed to be the widespread adoption of student-led conferences. Teachers at five grade levels shared data and information to expand this process. Parents responded with enthusiasm and students became

once again proud disseminators of their own learning.

Writing a Goals 2000 Grant was the next step toward dissemination of alternative assessment to grades K-14. Clear View provided the leadership for eleven elementary schools, two middle schools and two high schools to form the Pathways 2000 Consortium to begin the process of looking at student work and elevating student learning.

Years Four-Five

The goals for these years included: Extending the portfolio assessment to include Mathematics, becoming involved in the National New Standards Portfolio Field Test (California) and stretching the learning as educators to match student work with other schools throughout the nation, and refining and expanding the consistent use of grade level protocols to allow students to have videos of their exhibitions K-6.

Clear View also expanded the use of student-led conferences to include more electronic portfolios and continued the efforts of Pathways 2000 to include a School Change Portfolio for all fifteen schools K-12.

Monitoring and adjusting the previous work became major efforts because the growth increments were small. As the staff continued learning about and refining alternative assessment, we were confident that these components were motivating the students toward greater achievement. Measuring powerful student learning in meaningful ways provided students with a variety of methods to articulate their own learning and, in the process, internalized the important ingredient--self-motivation.

This is only the story of one school as it ventured down the *Information Superhighway*. Every school in our nation is asking the questions, How can we make a difference by using technology? Schools must be prepared to conduct thorough evaluations of the impact that technology is having on learning. Schools would be wise to look at a variety of indicators of success. Keep data in a convenient location and usable format where it is accessible to those who are teaching the students everyday in the classrooms. Ask questions of each other as a community of learners. If nothing else ask, "Isn't this interesting, now what can we do about it?"

Using computers in a social science classroom might not increase scores on a standardized social science test, but it may enhance the student's ability to obtain and analyze information, solve problems, work together as a group, and write about findings. Clear View has no doubt that technology has made a difference in student learning. Creating a powerful vision, planning for the long term taking short steps, preparing teachers not only in how to use the equipment but how to teach with it, and providing an arena for reflection with out eyes on student achievement.

Clear View's journey can be summed up in the words of just one of the 8,000 visitors that came to see vision put into active student learning. "These students harness the power of

the computer to provide data in a real life situation. Students are asking scientific questions, devising investigation plans, conducting investigations, gathering data and analyzing results to draw conclusions- - like real scientists while using computers in real world applications."